

# Title of the Invention

VEHICLE SEAT, A SKIN MATERIAL FOR A VEHICLE  
SEAT AND A METHOD OF MANUFACTURING THE VEHICLE  
SEAT

## Background of the Invention

### 1. Field of the Invention

The present invention concerns a vehicle seat and, particularly, it relates to a vehicle seat used in outdoors and a method of manufacturing a vehicle seat, which has good finishing, high physical properties, durability and weather proofness and can be manufactured efficiently, as well as a skin material for the vehicle seat and a method of manufacturing the vehicle seat.

### 2. Statement of the Relates Art

A vehicle seat has been formed, for example, by disposing a cushioning material on a bottom plate and covering them with a skin material. For the vehicle seat, a seat of a concave/convex shape has been proposed particularly in view of aesthetic design or convertible feeding upon riding. For example, a method of using a tack last technique for forming the concave/convex portion or a method of covering a cushioning material with a skin material by stitching has been known for the method of

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The method of covering a cushioning member 120 with a skin material 110 having the concave/convex shape formed by stitching involves a drawback that undesirable separation is caused between the skin material 120 and the cushioning material 120 at the concave/convex portion, particularly, at the concave portion.

In order to solve the foregoing problem, a vehicle seat formed by coating an adhesive on the seating area of the cushioning material and bonding the skin material thereto has been known. In this vehicle seat, an adhesive is coated at predetermined portions including ridges of the cushioning material.

However, when a rider sits on the seat, since a load exerts most concentrically on the ridges of the cushioning material, and, if the skin material is secured at the ridges to the cushioning material, excessive force exerts on the skin material to undesirably flex or crease the seat.

Further, in the method of covering the cushioning material 120 with the skin material 110, it is necessary to prevent water or dusts from intruding into the cushioning material 120 through joined portions of a plurality of skin materials 110 stitched to each other. For this purpose, a water proof film (not illustrated) is disposed between the skin material 110 and the cushioning material 120 at the stitched portions of the skin material 110 to prevent intrusion of rain water or the like by the water proof film.

In the method of using the water proof film described above, it is necessary to dispose the water proof film accurately for enabling to prevent water or

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dusts from intruding through the joined portions by situating the water proof film at appropriate positions.

Further, in a vehicle seat formed by covering the cushioning material 120 with the skin material 110 by stitching, since separation tends to be caused between the skin material 110 and cushioning material 120 at concave/convex portions, particularly, at concave portions, a method of coating an adhesive between the skin material 110 and the cushioning material 120 to prevent separation has been known.

When the adhesive is coated between the skin material 110 and the cushioning material 120, if the water proof film is not disposed at an appropriate position, the water proof film comes into an adhesive coating region to suffer from twisting by the deposition of the adhesive, or the water proof film is put between the adhesive and the skin material 110, to interfere the adhesion between the skin material 110 and the cushioning material 120.

Therefore, it is necessary to accurately cut off the water proof film at exact positions, but the operation conducted while confirming the cut off position is laborious, to result in a problem that the operation can not be conducted efficiently.

Further, the vehicle seat is generally formed as an integral cellular molding product comprising a skin

material, a cushioning material and a bottom plate, for example, a polyvinyl chloride skin material and a polyurethane cellular material.

As shown, for example, in Fig. 15 and Fig. 16, the vehicle seat comprises a skin material 110 and a cushioning material 120, and the skin material 110 is constituted by applying a surface treating acrylic material 111 to a synthetic resin 112 or laminating a synthetic resin 112 on a substrate fabric 113 and applying a surface treating material 111 on the synthetic resin 112. Then, the skin material 110 is bonded at the surface of the synthetic resin 112 or the substrate fabric 113 using an adhesive 140 to the cushioning material 120.

In the prior art described above, if a polyvinyl chloride skin material is used, for example, as the synthetic resin 112, it results in a drawback that vinyl resin-like gloss appears on the surface to lack in a grave feeling.

Further, contact between the skin material 110 and the cushioning material 120 results in the following disadvantages.

That is, a plasticizer contained in the synthetic resin 112 migrates to the cushioning material 120 to deteriorate the cushioning material.

Further, when a plasticizer contained in the

synthetic resin 112 migrates to the cushioning material 120, the amount of the plasticizer contained in the synthetic resin 112 is decreased to make the synthetic resin 112 hard and worsen the feeling upon sitting on the seat.

Further, an amine catalyst contained in the cushioning material 120 gives an effect on the synthetic resin 112 to cause discoloration or fading in the synthetic resin 112, thereby deteriorating the aesthetic appearance of the vehicle seat.

Further, if a solvent type adhesive is used as an adhesive 140 for bonding the skin material 110 and the cushioning material 120, a solvent contained in the adhesive migrates to the synthetic resin 112 to discolor the synthetic resin 112.

For overcoming the drawbacks described above, it has been known a method of preventing migration of the plasticizer or the amine catalyst by disposing an amide type resin film or a polyethylene type resin film between the skin material and the cushioning material, but this increases the number of parts to make the manufacturing cost expensive and increase the number of steps.

#### SUMMARY OF THE INVENTION

An object of the present invention is to provide a

vehicle seat in which a water proof film is disposed accurately at stitched portions of a skin material for covering a cushioning material and reliably preventing water or dusts from intruding through the stitched portions of the skin material, as well as a method of manufacturing such a vehicle seat.

Another object of the present invention is to provide a vehicle seat with preferred finishing, having high durability and capable of being manufactured efficiently, as well as a method of manufacturing such a vehicle seat.

A further object of the present invention is to provide a skin material for use in a vehicle seat having a satisfactory appearance, and capable of preventing migration of a plasticizer contained in a synthetic resin to a cushioning material without increasing the number of parts and a number of steps, thereby preventing worsening of feeling upon sitting on a seat and degradation of the cushioning material.

A further object of the present invention is to provide a skin material for use in a vehicle seat free from the worry of discoloration or fading in the skin material caused by an amine catalyst contained in a cushioning material.

A further object of the present invention is to

provide a skin material for use in a vehicle seat capable of preventing discoloration of a skin material caused by migration of a solvent to the skin material when a solvent type adhesive is used for bonding the skin material and the cushioning material.

A still further object of the present invention is to provide a skin material for use in a vehicle seat that can be bonded by high frequency welding.

A still further object of the present invention is to provide a skin material for use in a vehicle seat having satisfactory leather-like feeling, with no degradation due to abrupt shifting of load when a rider sits on the seat and showing high weather proofness to the weather.

In the present specification, "vehicle seat" includes those seats for land motorcycles or scooters, as well as snow mobiles and water motorcycles and, further, includes vehicle seats for tricycled buggy vehicles, mounting vehicles or building machine seats.

The present invention is to be explained with reference to embodiments based on claims.

A vehicle seat S of the present invention has a constitution in which a cushioning material 20 is disposed on a bottom plate 30, and the cushioning material 20 is covered with a skin material 10.



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The skin material 10 and the cushioning material 20 are bonded with an adhesive 40 coated to a region 50 inward of a ridge 12 for a seating area of the cushioning material 20, excepting for the top end of the seat. The adhesive 40 is coated to one or both of the skin material 10 and the cushioning material 20.

When the skin material and the cushioning material are bonded by the adhesive in this way, it suitably facilitates the assembling operation between the cushioning material and the skin material.

Further, since the adhesive is coated to a region inward of the ridge for the cushioning material, the skin material is not secured at the ridge portion undergoing a most localized load, no excessive force exerts on the skin material, thereby preventing occurrence of flexion or crease, to obtain a vehicle seat of good appearance.

Further, the skin material 10 is formed by joining a skin material 10a including a seating area and a skin material 10b not including the seating area.

Stitching of a plurality of skin materials in this way it is possible to form a desired concave/convex shape.

A concave groove 22 is formed at a predetermined position including a joining line 10c for joining the skin material 10a and the skin material 10b, on the side of the ridge 23 of the cushioning material 20 from the joining

line 10c to a region of the seating area. Then, a water proof film 21 is disposed between the skin material 10 and the cushioning material 20 from the skin material 10b not including the region of the seating area to the position for the concave groove 22.

As described above, in the vehicle seat of this embodiment, since the concave groove is formed at a predetermined position including the joining line on the side of the ridge of the cushioning material, from the joining line to the region of the seating area, the water proof film can be disposed simply at an appropriate position by disposing the water proof film from the skin material not including the region of the seating area to the position for the concaved groove, with the concave groove being as a guide line.

The skin material 10 comprises a PVC layer 12, a substrate fabric 13 composed of a knitted material and a closed-cell cellular synthetic resin 14 laminated in this order, and an acrylic or vinyl chloride type surface treating material 11 is applied to the PVC layer 12.

An acrylic or vinyl chloride type surface treating material 11 is applied to the PVC layer 12.

As described above, since the surface treating material 11 is disposed to the skin material 10, an embossing fabrication can be applied to the surface

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treating material 11, thereby providing the seat surface with a leather-like feeling to obtain a satisfactory vehicle seat having grave feeling in view of appearance.

When a vinyl chloride - acrylate copolymer resin or a vinyl chloride - methacrylate copolymer resin is used as the surface treating material 11, a high frequency welding can be applied to secure the skin materials 10 with each other or secure the skin material 10 at the peripheral end thereof to the bottom plate 30 reliably and easily.

The substrate fabric 13 composed of knitted material is made of yarns comprising at least one of nylon yarns, polyester yarns or rayon yarns.

Since the substrate fabric 13 is disposed in adjacent with the PVC layer 12, when the skin material 10 is pulled, no direct force is applied to the closed-cell cellular material 14 to prevent breakage of the closed-cell cellular material 14.

Further, since the closed-cell cellular material 14 is present between the PVC layer 12 constituting the skin material 10 and the cushioning material 20, the plasticizer contained in the PVC layer 12 no more migrates through the substrate fabric 13 to the cushioning material 20 thereby enabling to prevent degradation of the cushioning material 20.

Further, since the closed-cell cellular material 14

is present between the PVC layer 12 and the cushioning material 20, the plasticizer contained in the PVC layer 12 no more migrates through the substrate fabric 13 to the cushioning material 20 thereby enabling to prevent hardening of the PVC layer due the decrease of the plasticizer to prevent disadvantage that the feeling upon sitting on the seat is worsened.

Further, since the closed-cell cellular material 14 is present between the PVC layer 12 and the cushioning material 20, an amine catalyst contained in the cushioning material 20 no more migrates to the PVC layer 12 to prevent discoloration or fading in the PVC layer 12. In this way, it is possible to prevent the disadvantage of deteriorating the aesthetic appearance of the vehicle seat always exposed externally to the weather.

Further, since the cellular material 14 of the closed-cells is present between the PVC layer 12 and the cushioning material 20, a solvent contained in the adhesive for bonding the skin material 10 and the cushioning material 20 no more migrates to the PVC layer 12 to prevent discoloration of the PVC layer 12.

It is suitable that the closed-cell cellular material 14 is a crosslinked cellular material and, more specifically, a PVC cellular material.

Crosslinked cellular material has heat resistance

and shows excellent weather resistance when exposed to the broiling weather for a long period of time.

Further, use of the PVC cellular material as the closed-cell cellular material 14 can reliably cover the cushioning material 20 of poor water proofness in spite of the laminate structure, thereby enabling to ensure the weather proofness of the seat. Further, this can provide a satisfactory leather-like feeling to the skin material.

Furthermore, since lamination of the cushioning closed-cell cellular material 14 on the cushioning material 20 gives a nature of moderating impact shock, rider's sitting shock is moderated. Furthermore, it also provides an effect of causing less degradation by abrupt shifting of load upon sitting to obtain a high durability.

The skin material 10 may contain a protein material. With such a constitution, it provides an effect of making the surface of the vehicle seat not sticky but giving smooth and fresh feeling. It is possible to prevent undesirable moistened feeling upon sitting, and this can facilitate cleaning upon contamination of the seat surface. Furthermore, it also provides an effect of providing moderate gloss to the surface of the seat to improve the aesthetic appearance of the seat.

The method of manufacturing the vehicle seat comprises the following steps.

At first, an adhesive 40 is coated to a region inward of a ridge 23 for the seating area of a cushioning material 20. Further, an adhesive 40 is coated on the surface of a skin material 10 in contact with the region inward of the ridge 23 for the seating area of the cushioning material 20.

Then, the skin material 10 and the cushioning material 20 are press-bonded to cover the cushioning material 20 with the skin material 10.

Alternatively, it may be adapted a method of vacuum forming a skin material 10, coating an adhesive 40 to the region inward of the ridge 23 for the seating area of the cushioning material 20 and the surface of the skin material 10 is contact with a region inward of the ridge 23 for the seating area of the cushioning material 20, then press bonding the skin material 10 and the cushioning material 20 and covering the cushioning material 20 with the skin material 10.

As described above, by vacuum formation of the skin material, it is possible to cope even with the cushioning material of an abrupt concave/convex shape to ensure the freedom of the design and the performance.

Alternatively, a concave groove 23 may be formed to a cushioning material 20 on the side facing a skin material 10 at a predetermined position including a

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joining line 10c for the skin material 10 in a region from the joining line 10c to the seating area.

Then, a water proof film 21 is attached to the cushioning material 20. Further, the water proof film 21 is cut off along the concaved groove 23.

Then, an adhesive 40 is coated to the surfaces of the cushioning material 20 and the skin material 10 in contact with each other to press-bond the skin material 10 and the cushioning material 20. Finally, the cushioning material 20 is covered with the skin material 10.

As described above, in the method of manufacturing the vehicle seat according to the present invention, a concave groove is disposed to the cushioning material, and the water proof film can be disposed at an appropriate position by merely cutting off the water proof film along the concave groove with the concave groove being as a guide line, to improve the operation efficiency.

#### Brief Description of the Drawings

Fig. 1 is a perspective view showing a vehicle seat according to the present invention;

Fig. 2 is a cross sectional taken along line A-A in Fig. 1;

Fig. 3 is a perspective view showing a cushioning material;

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Fig. 4 is a cross sectional view taken along line B-B in Fig. 3;

Fig. 5 is a cross sectional view for a main portion of a vehicle seat;

Fig. 6 is an enlarged cross sectional view for a groove portion;

Fig. 7 is an explanatory view showing a vehicle seat using a vacuum formed skin material;

Fig. 8 is a cross sectional view taken along line C-C in Fig. 7;

Fig. 9 is a perspective view showing another example for the shape of a seat for use in a motorcycle;

Fig. 10 is an explanatory view showing a prior art example;

Fig. 11 is an explanatory view showing a prior art example;

Fig. 12 is an explanatory view showing a prior art example;

Fig. 13 is an explanatory view showing a prior art example;

Fig. 14 is an explanatory view showing a prior art example;

Fig. 15 is an explanatory view showing a prior art example; and

Fig. 16 is an explanatory view showing a prior art



example.

#### Preferred Mode of Practicing the Invention

In this embodiment, explanation is to be made to an example of a motorcycle seat S as a vehicle seat.

A motorcycle seat S of this example is a motorcycle seat in which a cushioning material 20 is disposed on a bottom plate 30, and the cushioning material is covered with a skin material 10. That is, the seat is formed by placing a cushioning material 20 on the bottom plate 30, covering the cushioning material 20 with the skin material 10, and securing the peripheral end of the skin material 10 at the rear face of the bottom plate 30.

The skin material 10 is formed conforming a sterical shape of the cushioning material 20 by stitching a skin material 10a including a region of a seating area and a skin material 10b not including the region of a seating area such that the cushioning material 20 may be covered. A joining line 10c is defined as a joined portion between the skin material 10a including the region of a seating area and the skin material 10b not including a region of the seating area.

Then, the constitution of the material for the skin material 10 is to be explained. Fig. 2 is a cross sectional view taken along A-A in Fig 1. The skin material 10 comprises a lamination of a PVC layer 12 on

the surface, a substrate fabric 13 and a synthetic resin closed-cell cellular synthetic resin 14. That is, the PVC layer 12 and the closed-cell cellular material 14 are laminated with the substrate fabric 13 put therebetween. As described above, closed-cell cellular material 14 is present between the PVC layer 12 and the substrate fabric 13, and the cushioning material 20. The closed-cell cellular material 14 is a crosslinked cellular material, more specifically, a PVC cellular material 14 is used.

The skin material 10 is applied with a surface treating material 11 and optional embossing is applied to the outside of the skin material 10 to so as to provide leather-like feeling. Embossing can be applied by using a known pressing machine or embossing machine such as a gravure pressing machine or roll embossing machine, and a concave/convex shape of an embossing plate is formed on the seat by heat and pressure.

The surface treating material 11 in this embodiment comprises, more specifically, a vinyl chloride - acrylate copolymer resin or a vinyl chloride - methacrylate copolymer resin.

As the PVC layer 12, PVC and a protein powder of 1 to 40  $\mu$ m grain size (for example, fine powder of natural protein fiber) compounded together may be used.

The protein powder having a grain size of from 3 to

8  $\mu\text{m}$ , preferably, 4 to 7  $\mu\text{m}$  is used for ensuring uniform dispersion for the thickness of the PVC material 11 that forms the surface layer of the skin material 10.

The substrate fabric 13 in this embodiment comprises a knitted material of using nylon yarns, polyester yarns, rayon yarns or like other synthetic resin yarns.

In this embodiment, an adhesive (urethane-type) not illustrated is coated to the surfaces of the substrate fabric 13 in contact with the PVC layer 12 and the closed-cell cellular material 14 respectively, and the substrate fabric 13 and the PVC layer 12, and the substrate fabric 13 and the closed-cell cellular material are formed integrally.

In this embodiment, PVC cellular material is used as an example of the closed-cell cellular material but PE foams (polyethylene foams) and PP foams (polypropylene foams) may also be used in addition to the PVC cellular material. Also in this case, the material is constituted as the closed-cell cellular material.

The PVC layer 12, the substrate fabric 13 and the closed-cell cellular material 14 that constitute the skin material 10 can be laminated not only by the method of coating the urethane type adhesive to the substrate fabric but also by other known techniques.

For example, each of the layers can be bonded by

high frequency welder processing to each other. A predetermined fabrication line can be formed by the high frequency welder processing.

Since the skin material 10 of this embodiment is composed of materials that can be bonded by high frequency welding such as the surface treating material 11 comprising the vinyl chloride - acrylate copolymer resin or the vinyl chloride - methacrylate copolymer resin, and the PVC layer 12, high frequency welding can be applied easily to portions for joining a plurality of skin materials. Accordingly, it is possible to provide the joined portions with a strength efficiently and reliably.

Then, the cushioning material 20 in this embodiment is to be explained. The cushioning material 20 in this embodiment is made of urethane foams. As shown in Fig. 3, a water proof film 21 is appended to the cushioning material 20 at a position corresponding to the joined portion of the skin material 10 in this embodiment.

Fig. 4 is a cross sectional view taken along line B-B in Fig. 3, which illustrates a cross section of the cushioning material 20 to the right of line b-b. As shown in Fig. 4 and Fig. 5, a concave groove 22 is formed on the side of an ridge 23 of the cushioning material 20, at a predetermined position including a joining line 10c along which a skin material 10a and a skin material 10b are

joined from the joining line 10c to a region of the seating area.

Then, the water proof film 21 is disposed with the concave groove 22 being as a guide line. That is, as shown in Fig. 6, the water proof film 21 is cut off at a position of the concave groove 22. Thus, the water proof film 21 is disposed at an appropriate position on the seating face of the cushioning material 20 without extending to a bonding face 50 between the skin material 10 and the cushioning material 20 as will be described later.

In this embodiment, the shape of the concave groove 22 is shown as a substantially V-shaped cross section so that a cutting means such as scissors can be inserted easily upon cutting off the water proof film 22, but the shape of the groove is not restrictive and it may also be a rectangular or substantially U-shaped cross section.

In this embodiment, when the skin material 10 is covered to the cushioning material 20, they are bonded by an adhesive 40. The adhesive 40 is coated on one or both of the skin material 10 and cushioning material 20 and various types of adhesive may be used.

The adhesive 40 comprises, for example, a hot melt adhesive in the form of a adhesion film, and the hot melt adhesive includes those containing active double bonds in

the adhesive and hardened under the irradiation of UV-rays or electron beams, those having epoxy groups and a latent curing agent and hardened thermally, those containing NCO groups and  $\text{Si(OR)}_3$  groups and hardened under the presence of moisture and those containing SH groups and a metal oxide catalyst and hardened by oxygen. Urethane type moisture curing adhesive is particularly preferred. An actual example of the urethane type moisture curing adhesive is a moisture curing hot melt adhesive mainly comprising a polyester type isocyanate pre-polymer, and commercially available products can be used therefor.

In this embodiment, a solvent type adhesive may also be used as the adhesive 40. As described above since the closed-cell cellular material 14 is disposed between the PVC layer 12 constituting the skin material 10 and the cushioning material 20 in this embodiment, migration of the solvent to the PVC layer 12 is prevented.

In the motorcycle seat S of this embodiment, as shown in Fig. 1, the skin material 10 and the cushioning material 20 are bonded within a bonding range 50 which is a region inward of the ridge 23 for the cushioning material 20.

Then, explanation is to be made to the bottom plate 30.

The bottom plate 30 is molded from a synthetic resin

in this embodiment. On this bottom plate of the synthetic resin, the cushioning material 20 is placed and the cushioning material 20 is covered with the surface material 10 and the peripheral end of the skin material 10 is secured to the back of the bottom plate 30. The bottom plate 30 is made of a synthetic resin in this embodiment, but various kinds of materials may be used for the bottom plate.

The peripheral end of the skin material 10 can be secured to the bottom plate 30 by securing the peripheral end of the skin material with a securing means such as staples, or by applying high frequency welding.

That is, since the skin material 10 in the present invention comprises materials that can be welded by high frequency welding such as the surface treating material 11 made of a vinyl chloride - acrylate copolymer resin or a vinyl chloride - methacrylate copolymer resin and the PVC material, high frequency welding means such as supersonic welding or radio frequency welding can be used. The treatment for the peripheral end can be applied reliably and efficiently by adopting the high frequency welding.

In this embodiment, the explanation has been made to the motorcycle seat S as an example, so that the cushioning material 20 is placed on the bottom plate 30, and the peripheral end of the skin material is secured to

the bottom plate 30. In a seat of other constitutions, for example, in a seat for use in building machines, the cushioning material is placed on a frame, and the peripheral end of the skin material 10 is secured to the frame.

Then, a method of manufacturing the motorcycle seat S according to the present invention is to be explained. At first, an adhesive for bonding the water proof film 21 is coated on the cushioning material 20, and the water proof film 21 is appended to the cushioning material 20.

In this embodiment, since the concave groove 22 is formed to the cushioning material 20, the water proof film 21 is cut off at a portion of forming the concave groove 22 with the concave groove 22 as a guide line.

Further, the adhesive is coated on the region 50 inward of the ridge 23 for the seating area of the cushioning material 20. The adhesive 40 is coated to one or both of the skin material 10 and the cushioning material 20.

Finally, the skin material 10 and the cushioning material 20 are press-bonded to cover the cushioning material with the skin material 10, and the peripheral end of the skin material is applied with heat treatment or tack last treatment, to complete the motorcycle seat S.

In addition to the manufacturing method described



above, the skin material 10 may be molded to a concave/convex shape by vacuum forming and joined to the cushioning material 20. By vacuum forming the skin material 10, the skin material 10 can be provided with the concave/convex shape conveniently.

In the prior art, when a motorcycle seat S having a complicate concave/convex shape is to be formed, a sterical configuration is formed by stitching a plurality of skin materials 110 as shown in Fig. 12 to Fig. 14 for providing the skin material 10 with the concave/convex portion conforming the seat configuration. However, when the vacuum forming is adopted, even a motorcycle seat S having a complicate concave/convex shape, for example, as shown in Fig. 9, the skin material 10 can be provided with such concave/convex shape simply conforming the seat configuration.

Fig. 7 shows a motorcycle seat S using a skin material 10 molded by vacuum forming. Fig. 8 is a cross sectional view taken along line C-C in Fig. 7, which shows a cross section of the motorcycle seat S left to line c-c in the figure. As shown in Fig. 8, an adhesive 40 is coated to a skin material 10 molded into a concave/convex shape by vacuum forming, and a cushioning member comprising a cushioning material 20 and a bottom plate 30 is placed under pressure in a mold frame and secured.

Alternatively, a method of coating an adhesive 40 to a skin material 10 molded into a concave/convex shape in a mold frame and then charging a starting material for urethane foams and molding the same by blowing may be used.

The vacuum formation of the skin material 10 can cope with a cushioning material even if it has an abrupt concave/convex shape thereby enabling of ensure the freedom of design and high performance.

In the foregoing embodiment, the explanation has been made to a single-seat type motorcycle seat S as a motorcycle seat S, but it may be used for a two seat type as shown in Fig. 9, and there is no particular restriction for the shape of the seat.

#### Industrial Applicability

According to the present invention, the following effects can be obtained:

(1) Since the skin material and the cushioning material constituting the vehicle seat are bonded by the adhesive coated to the region inward of the ridge for the seating area except for the top end of the seat, the skin material is not secured at the ridge which most undergoes the localized load, so that no excessive force exerts on the skin material thereby preventing occurrence of flexion or creasing to obtain a vehicle seat of favorable appearance.

(2) Since the skin material is not bonded but left free from the vicinity of the ridge of the cushioning material to the peripheral end, covering to the cushioning material and assembling work such as tack last treatment can be conducted easily to improve the operation efficiency.

(3) Since the concave groove is formed to the cushioning material on the side facing the skin material including the seating area, at a position spaced apart by a predetermined distance from the joining line between the skin material including the seating area and the skin material not including the seating area along the joining line, the water proof film can be disposed simply at an appropriate position by disposing the water proof film from the skin material not containing the seating area to the position for the concave groove with the concave groove being as the guide line.

(4) The skin material comprises the PVC layer, the substrate fabric made of knitted material and the closed-cell cellular synthetic resin laminated successively, and surface treating material the acrylic or vinyl chloride material is applied to the PVC layer. Since the surface treating material is applied to the skin material, the surface treating material can be embossed to provide a seat surface with a leather-like feeling, to obtain a satisfactory vehicle seat having a grave feeling in view

of appearance.

(5) When the vinyl chloride - acrylate copolymer resin or the vinyl chloride - methacrylate copolymer resin is used for the surface treatment material, high frequency welding can be applied and bonding of the skin materials to each other and the securing of the peripheral end of the skin material to the bottom plate can be conducted reliably and easily.

(6) Since the substrate fabric is disposed in adjacent with the PVC layer, when the skin material is pulled, the tension does not directly exert on the closed-cell cellular material, thereby enabling to prevent breakage of the closed-cell cellular material.

(8) Since the closed-cell cellular synthetic resin material is present between the PVC layer constituting the skin material and the cushioning material, migration of the plasticizer contained in the PVC layer through the substrate fabric to the cushioning material can be eliminated to prevent degradation of the cushioning material.

(9) Since the closed-cell cellular synthetic resin material is present between the PVC layer constituting the skin material and the cushioning material, migration of the plasticizer contained in the PVC layer through the substrate fabric to the cushioning material can be

eliminated to prevent the PVC layer from hardening by the decrease of the plasticizer and prevent the disadvantage of worsening the feeling upon sitting on the seat.

(10) Since the closed-cell cellular synthetic resin material is present between the PVC layer constituting the skin material and the cushioning material, migration of the amine catalyst contained in the cushioning material to the PVC layer can be eliminated to prevent discoloration and fading of the PVC layer. As described above, it is possible to prevent the disadvantage of deteriorating the aesthetic appearance of the vehicle seat always exposed externally to the weather.

(11) Since the closed-cell cellular synthetic resin material is present between the PVC layer constituting the skin material and the cushioning material, even if a solvent type adhesive is used for bonding the skin material and the cushioning material, the solvent contained in the adhesive does not migrate to the PVC layer, to prevent discoloration of the PVC layer.

(12) Since the crosslinked cellular material of excellent heat resistance is used for the closed-cell cellular material, it is possible to prevent degradation of the cellular material even when it is exposed to the broiling weather for a long time.

(13) Since the PVC cellular material is used as the

closed-cell cellular material, a cushioning material having poor water proofness, though being a laminate, can be covered firmly to ensure weather proofness of the seat and provide the skin material with leather-like feeling.

(14) Since shock-moderating property is obtained by laminating the cushioning closed-cell cellular material on the cushioning material, it can provide effects of moderating rider's shock upon sitting, and obtaining high durability with less deterioration caused by abrupt shifting of load upon sitting.

(15) Since the protein material is contained in the skin material, it provides the surface of the vehicle seat with non-tacky and smooth and fresh feeling. Undesirable moistened feeling of the seat during sitting is also eliminated and cleaning for the contaminated seat surface is facilitated. An appropriate gloss can be provided to the seat surface to improve the appearance of the seat.